Report to

Washington State Ferries

Revenue Collection System Overview

Deliverables Summary

Sierra Systems
10900 N.E. 8th Street, Suite 1110
Bellevue, WA 98004-1455 USA
www.SierraSystems.com

Contact: Shayne Boyd
Phone: 425.586.5316
Fax: 425.451.4430
Email: ShayneBoyd@SierraSystems.com

Sierra
New thinking.

Date: February 5, 2003

PLEASE NOTE THAT IBM recently completed its acquisition of PricewaterhouseCoopers' global management consulting and information technology services business, PwC Consulting. As a result, PwC Consulting is no longer a part of the PricewaterhouseCoopers network of firms, and is now a part of the IBM Global Services business unit. IBM (including IBM Global Services) and PricewaterhouseCoopers are not the same organization, and neither governs or is affiliated with the other, or any affiliate, subsidiary or division of the other.

The following document distinguishes between the terms: “Project Team” and the “Sierra Systems Project Team.” The term “Project Team” refers to the Washington State Ferries (WSF) personnel and all external consultants staff. The reference to the “Sierra Systems Project Team” is to be understood as the Sierra Systems Group Inc. (Sierra Systems) staff and the members of the IBM team.

TABLE OF CONTENTS

APPENDICES

1. INTRODUCTION

The purpose of this document is to present the Revenue Collections System (RCS) Project—Phase One recommendations in summary form. During RCS—Phase One, the following six deliverables were developed. Together, these form the foundation for our recommendations:

- Current State Workflows and Narratives—Documenting the Point-of-Sale (POS) system
- Current System Assessment—Describing POS deficiencies and making recommendations
- Future Business Requirements—Determining RCS requirements for the Phase II RFP
- Future Topology—Describing Network and technology requirements to support RCS
- Conceptual Design—Defining Business requirements, processes and functions for RCS
- Migration Issues—Describing decisions and questions that impact migration to the RCS environment

Three of these deliverables are the genesis of this summary: the Current System Assessment, the Conceptual Design and the Migration Issues. These deliverables describe the future RCS and the recommendations made by the Project Team. From the content of these documents, the reader may gain the detailed background necessary to better understand and answer the; who, what, where, when, why and the "how to" questions as they relate to implementing RCS.

1.1. Background

The Washington State Ferries' (WSF) fleet has 28 vessels operating out of 20 terminals, including one international terminal. Each terminal has its own unique characteristics derived from the:

- Number of routes and sailings it serves
- Links to other transportation providers
- Local street traffic patterns
- Connection to WSF/WSDOT infrastructure
- Regional customer base
- Proximity to WSF management

WSF's existing custom-built Point-Of Sale (POS) system was designed to support ferry operations while addressing WSF's revenue collection needs. Implemented in 1994, the POS system design was based on the then legacy systems. The POS system addresses and responds appropriately to a limited subset of the terminal characteristics noted previously. The POS system currently meets basic operational needs with acceptable reliability; however, the technology and equipment are aging, and it is estimated the system will not meet WSF's revenue collection needs beyond the year 2004. With existing technology and equipment reaching the end of their useful lives, RCS is being considered as a replacement for the POS system, as well as for the back office accounting applications.

RCS will replace or update all revenue applications and related interfaces as well as integrate all revenue collection points into one system. As well, RCS will help to standardize WSF revenue transactions. The typical transaction will consist of three components: Sales—where a product is sold and payment occurs, Redemption—where the product is validated and accepted in exchange for a service, and Confirmation—where the service is consumed (i.e. boarding). The data captured at each point in the transaction can be used to validate the other two components of the transaction. WSF's vision for RCS includes the automation of many transactions and the future integration with the Regional Fare Coordination System and the Tacoma Narrows Bridge project.

1.2. POS Observations

In the course of developing the project deliverables, the Sierra Systems Project Team has made a number of observations that will affect the direction, design and implementation of the RCS. A summary of our observations follows:

- There is an extensive reliance on manual processes in the existing POS system and back office functions. These manual processes have an adverse impact on the WSF business environment in terms of customer satisfaction, throughput and employee productivity.
- The core POS system lacks for definitive redemption or confirmation points for fare media. The POS system is unable to provide timely and accurate data to support key operational needs.
- The POS system is not adequately integrated. Major POS system functional components like the reservations and inventory applications lack basic electronic interfaces.
- The POS system and its current systems-based internal controls are insufficient for audit reliance. The POS system lacks many fundamental controls (internal control features) found in current industry standard systems. As a result, manual compensating controls are currently required.
- The POS system does not ensure data is complete, accurate and captured on a timely basis. The impact of this system weakness is greatest in the statistical and transactional data, and on revenue recognition and reconciliation. Significant manual activity is required to validate this data.

2. RECOMMENDATION

The Project Team recommends that WSF adopt the Best Practices Alternative for the implementation of RCS. This alternative will replace the existing POS system, ARCS Inventory, ARCS Revenue Accounting, Sailing Statistics, WSF Reservations and back office systems, as well as the existing hardware and software. It will also replace the paper media with the RFCS Smart Card, install kiosks for customer self service, automate the confirmation of fare payment, and confirm vessel load counts with vehicle and pedestrian counters. The new architecture will fully support WSF's current and future business needs.

Historically, WSF's revenue collection applications (ECR, POS) were implemented in such a way that, while changes to terminal sales practices were introduced, there was little or no impact on the back office applications and business processes. RCS will have significant impact on almost every aspect of WSF's business. Front line and back office processes and procedures will be changed to align with the new functionality of RCS. Transactions will be recorded, tracked and accounted for with greater ease and efficiency. New financial systems and reporting tools will be implemented to support improvements in management reporting and accountability.

2.1. Results

Key results of implementing the Best Practices Alternative are:

- **Updated technology in the tollbooth**.
  - Replacement of the POS technology is necessary because it is near the end of its useful life, is not extensible and is often subject to physical failure. Current technology will allow for easier integration and ensure a long useful life for this system.
- **Consolidation of all WSF revenue and RCS transactions into one application.**
  - Currently, transactions initiated by contract agents, third party sellers and concessionaires, as well as other source systems, are not consolidated into the POS system. With a single system, consistent processes and appropriate internal controls, WSF can ensure that data is auditable, reporting is backed by verifiable information and decision making is based on supportable assumptions.
- **Foundation for the future automation of revenue transactions**.
  - The existing tariff policy requires interpretation by human operators. Fares should be defined in a way that can be determined by a system-driven, rules-based fare structure. Concurrent with the RCS Best Practices implementation, planning for system-wide automation will be undertaken, including planning for appropriate modifications to facilities and infrastructure.

2.2. Justification

The Best Practices Alternative is recommended as it provides WSF with the best possible viable long-term solution. Following are the key elements as contained in the WSF Project Charter that justify this option:

- A state of the art technology platform (See RCS Project Charter Goals and Objectives)
- Improvements to core business processes (See Best Practices in Conceptual Design)
- A solid foundation for significant future change (See Automate in Conceptual Design)
- A cost based payback within the useful life of the system (See detailed Cost Benefit Analysis)

See Appendix A for a description of the other alternatives that were considered.

2.3. Implementation

In the current environment, implementing the Best Practices Alternative will be most readily accomplished by separating this into two rollouts. The first will introduce the baseline functionality throughout the system at all terminals. During the second, elements of additional functionality will be implemented selectively, by terminal and by function, and may require significant capital expenditures.

To successfully implement the Best Practices Alternative, a structured approach should be followed, encompassing these key elements:

- Create and test the new data center, development platforms and the network infrastructure
- Acquire, install and configure package based revenue application and systems hardware
- Develop and test revenue applications, bolt on functionality, web applications and interfaces
- Install card readers, bar-code readers, turnstiles and customer service stations at all terminals
- Install confirmation equipment (vehicle metric and counters) at east and west side terminals
- Deploy terminal hardware (Terminal Agent workstations)
- Train user communities (Terminals, Head Office, IT, Contractors)
- Rollout new revenue collection functionality
  - Integrate the Contract Terminals (San Juan Islands/Sidney) into the system
  - Replace preprinted media with bar-coding printed at the point of issuance
  - Automate reconciliation of all revenue sources
- Rollout new back office applications (G/L, Reporting Tools)
- Integrate with RFCS (Smart Card)

3. BEST PRACTICES POLICY DIRECTION

The Best Practices alternative assumes that WSF will adopt the changes to policy and business processes proposed in this section. The process of accepting these recommendations and making policy decisions should include all of the affected stakeholders. Such changes in process, practice and guidelines will affect the entire organization and should have simultaneous input from senior management. These decisions will shape the design of the RCS application and should be made in advance of the issuance of an RFP for RCS Phase Two.

3.1. Customer Service

Policy Statement: **Improvements in customer service will be achieved through the optimal means available, including the use of technology and automation.**

Improvements in customer service will be achieved through the introduction of self-service (kiosk based) functionality for select transactions. As a component of the first rollout, and in anticipation of the rollout of additional functionality, appropriate modifications to facilities and infrastructure must come online at select terminals. Such modifications would include:

- Installation of equipment to fully automate passenger redemption
- Installation of equipment to automate the capture of vehicle metrics

Improvements in customer service will be achieved through an expansion in the use of alternative forms of payment. Promoting such instruments supports the elimination of checks as a method of payment for products and services at the tollbooths. Changes such as the following would be introduced:

- Process debit card, WSF card, Smart Card, credit card or e-check
- Establish database rules for fare determination
- Eliminate surcharge coupons

Improvements in customer service will be achieved through an expanded integration with external transit organizations. As a component of Best Practices, WSF will prepare the RCS technology for integration with the Regional Fare Coordination System and complete the integration when the Smart Card is available. In addition, RCS will integrate with the Tacoma Narrows Toll Bridge project. This will ensure WSF functionality will align with regional transit processes and capabilities.

Improvements in customer satisfaction will be achieved by integrating reservation and schedule data into RCS and providing access to such data in the tollbooth. Benefits to customers would include:

- Pre-allocated space on all routes for reservation and preferential load categories
- Tracking of auto-equivalent space (AEQs) sold and remaining for each sailing
- Expanded availability of reservations
- Partial load management (lane assignment and staging)
- Real-time data (Web, reader boards)

3.2. Internal Control

Policy Statement: **Improvements in internal control will be achieved through reengineering business processes, including the automation of existing manual processes and through the use of state of the art technology.**

Improvements in internal control will be achieved through maintaining an appropriate audit trail for prepaid media. Currently, it is inefficient to maintain an audit trail for, or to obtain an accurate count of, different types of media as they move through their life cycle; production, warehousing, distribution, sale, redemption and destruction. Introducing bar coding and Smart Card technology can significantly improve internal controls and the accounting for paper-based media.

Scanning prepaid media during the redemption process will allow for immediate validation and verification. Once captured, this data will provide support for the automation of fare determination and the reporting of fare revenue. Allowing prepaid media to be tracked online as they are scanned supports electronic cancellation once the media has been redeemed. The following changes are anticipated:

- Produce prepaid media, with bar coding, at the time of sale
- Scan all media at the point of redemption
- Phase out prepaid media once the Smart Card is implemented

Improvements in internal control will be achieved through ensuring the redemption activity occurs consistently through the WSF system. As a result of the lack of consistency in the existing system, WSF is unable to rely on redemption counts to validate other components of the transaction. This weakness will be addressed by ensuring that all passengers and vehicles boarding a vessel are tracked and counted, and the data is reported in a timely manner.

Capturing the redemption of fare media provides data that can be used to validate other components of the standard WSF transaction. Currently, printed media and monthly passes are not electronically scanned when they are redeemed. When redemption data is captured electronically, it can be compared to the RCS sales and the WSF bank deposits to validate revenue, recorded sales, sailing statistics and banking deposits. Changes would include:

- Collecting all passenger fares consistently
- Extending redemption processes to hazardous material and contract sailings

Improvements in internal control will be achieved through ensuring the confirmation activity occurs consistently through the WSF system. Confirmation points (i.e. face counters and vehicle counters) will enable verifiable revenue controls. This will address many of the failings in accountability in the existing POS system. All redemptions can be confirmed and would be auditable. The output from the redemption processes, supported by the results derived at the confirmation point, will validate that all revenue is collected and reported, and that opportunities for fraud are reduced. Data from sales, redemption, and confirmation points can be confirmed as being complete and accurate and can be compared for reconciliation purposes. Structural changes needed are:

- Installation of scanning devices at select terminals, at all control points
- Altering terminal configurations to create segregated holding areas

Improvements in internal control will be achieved through ensuring a firm transaction cutoff for sales and for loading will exist for each sailing. The existing system does not have a clear cutoff time for sales, a specific sailing, or vessel loading. A reasonable cutoff time will increase a window for communication, improve on-time sailings, as well as address safety concerns in the loading area and in the loading process. Structural changes needed include:

- Installation of face counting and vehicle counting equipment to automate passenger and vehicle counting as close to the boarding point as possible

3.3. WSF Resource Allocation

Policy Statement: **Improvements in resource allocation and utilization will be sought where alternate services of equal caliber are available.**

Improvements in resource allocation and utilization will be sought through improvements in the capture of detailed revenue and performance statistics. This WSF revenue data is not adequately captured on the POS system. Capturing and retaining the detail for all types of RCS transactions electronically, or accessing such data online, will support detailed matching, automated reconciliation, and allow for a more appropriate segregation of duties. The following should be included in RCS:

- Obtain more transaction details from the banks
- Introduce a cashier function
- Count and store statistics for all passengers (i.e. School Flat Fee)
- Automate refund processing
- Automate refunds of all Smart Card transactions

Improvements in resource allocation and utilization will be achieved through the elimination of charge accounts for commercial traffic. Phasing out such services would reduce manual processing and would allow for the elimination of commercial receivables functionality from RCS. Action needed:

- Cease offering charge accounts

Providing enhanced management reporting will support improvements in resource allocation and utilization. Currently such reporting is limited in the existing environment with incomplete data being captured in POS and financial applications being outside of the control of WSF. WSF should augment existing reporting tools with an integrated financial application (G/L, Reporting Tools). Enhanced reporting will support improvements in expenditure control and provide better management as well as operational reporting. Action needed:

- Develop financial management reports with the intent to measure financial performance by terminals, vessel sailings and routes, and to obtain better information for decision-making processes

Improvements in resource allocation and utilization will be sought through establishing fare confirmation as the primary task for the ticket seller at select terminals. Ticket sellers today are required to determine the fare and are not able to validate this result. Making this an automated, rules-based or system-driven outcome through the introduction of automated Vehicle Metrics Equipment will change the historical role of the ticket seller. Action needed:

- Address impacts on skill sets of employees

Appendix A. Description of Alternatives

To replace the existing POS system, WSF must design a system to address POS's shortcomings and to mitigate the risks of replacing a system that is an integral part of WSF's operations. There were four alternatives considered in detail. They were:

Replace

- Replace the POS system with its existing functionality intact
- Make little or no change to existing business processes
- Support revenue collection activities in an unchanged environment

Enhance (This is independent of the Replace alternative)

- Replace the POS system with its existing functionality intact
- Make little or no change to existing business processes
- Support revenue collection activities in an integrated environment
- Implement additional back-office systems

Best Practices

- Replace POS, while eliminating select functionality (Commercial A/R, Inventory)
- Make significant changes to existing business processes (Check Acceptance, Prepaid Media)
- Support revenue collection activities in an integrated environment (Single Revenue System)
- Implement additional back-office systems (G/L, Report Tools)
- Address weaknesses in systems controls and data reliability (Confirmation of Vessel Load)

Automate (This depends upon the Best Practices alternative being implemented and stable)

- Replace POS, while eliminating select functionality (Commercial A/R, Inventory)
- Make significant changes to existing business processes (Check Acceptance, Prepaid Media)
- Support revenue collection activities in an integrated environment (Single Revenue System)
- Implement additional back-office systems (G/L, Report Tools)
- Strengthen system controls and further improve data reliability (Automated Reconciliation)
- Extract hard benefits through reductions in staffing (Self Service Toll Booth)

Appendix B. RCS Project Charter Objectives

The following table summarizes how each of the alternatives that was considered meets the objectives of the RCS as stated in the Project Charter:

RCS PROJECT CHARTER REVIEW				
OBJECTIVES AND COMPONENTS	**Replace**	**Enhance**	**Best Practices**	**Automate**
1. Define and document the business processes and requirements for the new system while assuring alignment with customer needs, expectations, and maximize business efficiencies	N	N	Y	Y
2. Improve revenue controls and ability to audit the revenue system	N	N	Y	Y
3. Replace the aging POS, back office accounting, attendant interfaces/applications and integrate all revenue collection points into an integrated system	P	P	Y	Y
4. Integrate with Regional Fare Coordination System (RFCS) project	N	Y	Y	Y
5. Include contract San Juan Island and Sidney B.C. revenue collection and reporting in the new automated system	Y	Y	Y	Y
6. In anticipation of adoption of new tariff regulatory changes by the Department of Transportation, develop alternatives, recommend and implement approved revenue collection system initiatives such as expansion of monthly passes and period pricing of fares.	N	N	Y	Y
7. Develop an integrated turnkey electronic system encompassing hardware, software, and supporting multiple methods of payment at toll booths and off premise locations	N	P	Y	Y
8. Minimize the impact to transaction processing time at the tollbooth. Transaction processing will not change how early a customer must arrive at a terminal in order to make the sailing	P	Y	Y	Y
9. Incorporate and support established seller performance measures, policy and procedures	Y	Y	Y	Y
10. Support the evolution from the existing fare collection and control environment to the new system. Implementation of the new RCS must support a phased rollout strategy	P	P	Y	Y
11. Assure continued consolidated financial and traffic reporting, as well as improved/real time executive and management reports	P	P	Y	Y
12. Develop an application that will operate in WSF's information technology environment including client/server	Y	Y	Y	Y

RCS PROJECT CHARTER REVIEW				
OBJECTIVES AND COMPONENTS	**Replace**	**Enhance**	**Best Practices**	**Automate**
and local area networks				
13. Include comprehensive documented fare collection and control policies and operational procedures	N	Y	Y	Y
14. Develop, document and support opportunities for current and future improved vessel load statistics	N	P	Y	Y
15. Develop and document current and future system requirements for integrating Preferential Loading and Reservations	N	Y	Y	Y
16. Assure a smooth system transition, with an emphasis on training and on-going support	Y	Y	Y	Y
TOTAL: Y= Yes, P = Partial, N = No	**4, 4, 8**	**8, 5, 3**	**16, 0, 0**	**16, 0, 0**